

Application Serial No. 09/938,072
Amendment dated May 3, 2004
Reply to Office Action dated February 2, 2004

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for ceramizing starting glass of glass-ceramics into glass-ceramics, comprising at least the following steps:

heating the starting glass from an initial temperature T_1 to a temperature T_2 which is disposed above the glass transformation temperature T_G at which crystallization nuclei are precipitated;

holding the glass at the temperature T_2 for a period t_2 for the precipitation of crystallization nuclei;

further heating the glass to a temperature T_3 at which a crystal phase grows on the nuclei formed following the preceding steps;

holding the glass for a period t_3 at a temperature T_3 or heating during this period to a higher temperature T_4 until predetermined properties of the glass-ceramics have been reached; and

controlling the temperature curve with the help of a control loop comprising at least one temperature sensor for sensing the temperature and a heating unit as an actuator, wherein

the heating unit comprises short-wave IR radiators that heat the glass to be relaxed with a thermal dead time of less than 10 secs. and the heating unit IR radiators are of a high color temperature $>1,500^\circ C$, wherein the IR radiators of the heating unit comprise an IR radiation cavity defining a bordered space having at least one of reflective and backscattering boundary surfaces.

Claim 2 (canceled)

Claim 3 (previously presented): A method as claimed in claim 1, wherein the IR radiators are short-wave IR radiators with a color temperature $>2,000^\circ C$.

Claim 4 (canceled).

Application Serial No. 09/938,072
Amendment dated May 3, 2004
Reply to Office Action dated February 2, 2004

Claim 5 (previously presented): A method as claimed in claim 4, wherein the reflective or backscattering boundary surfaces comprise one or mixtures of several of the following materials: Al_2O_3 ; BaF_2 ; BaTiO_3 ; CaF_2 ; CaTiO_3 ; MgO ; $3.5\text{Al}_2\text{O}_3$; MgO ; SrF_2 ; SiO_2 ; SrTiO_3 ; TiO_2 ; quarzal; spinel; cordierite; cordierite sintered glass ceramics.

Claim 6 (canceled).

Claim 7 (previously presented): A method as claimed in claim 1, wherein the heating temperature to temperature T_2 is less than 120 secs., preferably less than 90 secs., and the temperature T_2 is less than 800°C.

Claim 8 (previously presented): A method as claimed in claim 1, wherein the holding temperature t_2 at temperature T_2 is in the range of 60 secs. to 3,600 secs.

Claim 9 (previously presented): A method as claimed in claim 1, wherein the heating time from temperature T_2 to temperature T_3 is less than 90 secs. and the temperature T_3 is higher than 700°C.

Claim 10 (previously presented): A method as claimed in claim 1, characterized in that the holding temperature t_3 at temperature T_3 and the heating time t_3 to temperature T_4 is in the range of 60 secs. to 1,800 secs.

Claim 11 (previously presented): A method as claimed in claim 1, wherein the starting glass to be ceramized is held on a non-liquid base.

Claim 12 (withdrawn): An apparatus for ceramizing a green glass, comprising at least 12.1 a heating unit; 12.2 a temperature sensor; 12.3 a closed-loop/open-loop control device for controlling the heating unit depending on the detected temperature and a predetermined temperature program, wherein 12.4 the heating unit comprises IR radiators for heating the glass to be relaxed with a thermal dead time of less than 10 secs., especially less than 5 secs.

Application Serial No. 09/938,072
Amendment dated May 3, 2004
Reply to Office Action dated February 2, 2004

Claim 13 (withdrawn): An apparatus as claimed in claim 12, wherein the heating unit comprises IR radiators of a high color temperature.

Claim 14 (withdrawn): An apparatus as claimed in claim 13, wherein the IR radiators are short-wave IR radiators with a color temperature of more than 1,500°C., especially more than 2,000°C., particularly preferably more than 2,400°C., and even more preferably more than 2,700°C.

Claim 15 (canceled).

Claim 16 (withdrawn): An apparatus as claimed in claim 12, wherein the reflective or backscattering boundary surfaces comprise one or mixtures of several of the following materials: Al₂O₃; BaF₂; BaTiO₃; CaF₂; CaTiO₃; MgO.3.5Al₂O₃; MgO; SrF₂; SiO₂; SrTiO₃; TiO₂; quarzal; spinel; cordierite; cordierite sintered glass ceramics.

Claim 17 (canceled).

Claim 18 (withdrawn): An apparatus as claimed in claim 12, wherein the apparatus comprises devices for storing the starting glass to be ceramized.

Claim 19 (previously presented): The method of claim 1 wherein the IR heaters heat the glass to be relaxed with a thermal dead time less than 5 secs.

Claim 20 (previously presented): The method of claim 1 wherein the IR radiators are short-wave IR radiators with a color temperature > 2400°C.

Claim 21 (previously presented): The method of claim 1 wherein the IR radiators are short-wave IR radiators with a color temperature > 2700°C.

Claim 22 (previously presented): The method of claim 7 wherein the heating time to temperature T₂ is less than 90 secs.

Application Serial No. 09/938,072
Amendment dated May 3, 2004
Reply to Office Action dated February 2, 2004

Claim 23 (previously presented): The method of claim 9 wherein the heating time from temperature T_2 to temperature T_3 is less than 60 secs.